REMARKS

Claims 2, 5, 8, 10 and 13 have been re-written to overcome the rejection under 35 U.S.C. §112 second paragraph. Please note that the amendments to these claims are to address the indefiniteness problems of those claims, and not to change the scope of the claims in any way.

Claims 1-13 remain under consideration in this application, with no claim previously allowed. Claims 14-19 were withdrawn from further consideration in this application, as being drawn to a non-elected invention.

Claims 1-13 stand rejected under 35 U.S.C. §112, second paragraph, as indefinite. Concerning Claims 2 and 10, those claims are amended so as to make the topology shown in Fig. 2B clearer by inserting the word --laterally-- before the phrase "surrounds said graded base region".

Concerning Claims 3 and 10, the Applicants respectfully traverse the Examiner's assertion that "rectangular ring shape" is not grammatically correct. The claimed rectangular ring shape is designated at 7 in the embodiment of Fig. 2B. See also page 8, line 29 of the specification. Accordingly, Claims 3 and 11 are not amended.

Claims 1-13 stand rejected as anticipated by *Bergeron* et al. (4,326,212). The Applicants respectfully traverse this rejection.

Bergeron et al. has no disclosure or suggestion of the claimed graded base region of the second conductivity type, disposed in the claimed uniform base region and having the ~~doping profile such that impurity~~ concentration decreases gradually along the lateral direction towards the claimed second main electrode region from the claimed first main electrode region, as stated in Claims 1 and 6. Here, the claimed lateral direction is defined as the direction parallel to the top surface of claimed uniform base region 31 as shown in Fig. 2C. The doping profile in the claimed graded base region 5 is shown in Fig. 4, in which the impurity concentration is gradually decreasing towards the claimed second main

electrode region 7 from the claimed first main electrode region 6. In Fig. 4, the abscissa represents the lateral distance measured from the center of claimed first main electrode region 6, and the carrier concentration gradually decreases from 5×10^{16} cm^{-3} to 1×10^{15} cm^{-3} along the lateral direction. On the contrary, column 5, lines 52- 57 in *Bergeron* states that "....and *upwardly* graded base in the intrinsic region.....", which is absolutely different from claimed impurity concentration decreasing gradually *along the lateral direction.*

Although the Examiner refers to element 74 of *Bergeron* as if that element corresponds to the claimed graded base region, the boron-implant layer 74 (See column 5, lines 26-31) is the p-type conductivity or the claimed first conductivity, which is distinguishable from the claimed graded base region of the second conductivity type, if one assumes the buried region 6 as n-type (the second conductivity type).

As the only base region having the second conductivity type, the PNP base 36 is found in Figs. 1d-1j. However, *Bergeron* et al. fail to show the claimed graded base region 5 disposed in claimed uniform base region 31, enclosing bottom and side of claimed first main electrode region 6 such that the claimed first main electrode region 6 is disposed in the center at the top surface of the graded base region 5 (See Fig. 2C). In *Bergeron* et al., the PNP emitter 62 is disposed at the right edge of the PNP base 36 as shown in Figs. 1i and 1j.

Furthermore, the PNP base 36 is identified as the claimed uniform base region by the Examiner. But, if the PNP base 36 corresponds to uniform base region, the claimed graded base region of the second conductivity type must be disposed in the uniform base region. However, one cannot find such graded base region of the second conductivity type in the PNP base 36. Therefore, *Bergeron* et al is silent about the claimed uniform base region of the second conductivity type disposed on the claimed first buried region having the uniform doping profile. Although *Bergeron* et al. shows NPN base 40, the NPN base 40 is p-type conductivity or the claimed first conductivity, which is distinguishable from claimed uniform base region of the second conductivity type. Therefore the Examiner's reference to element 40 is not correct as the claimed uniform base region 31.

Therefore, *Bergeron* et al. substantially differs from the claimed structure and cannot achieve the effectiveness of the claimed invention, which make possible to increase the maximum impurity concentration of the graded base region 5 in the lateral pnp transistor Q1 relative to that in the uniform base region 31. As the result, the base width Wb is reduced compared to the earlier lateral-pnp transistor Q1, so that a desired high breakdown voltage between claimed first and second main electrode regions can be obtained. Further, by the claimed semiconductor integrated circuit stated in Claim 6, the base width Wb can be reduced, so that the occupied space of the lateral pnp transistor Q1 decreases. As the result, the on-chip integration degree of the semiconductor integrated circuit can be raised. Further yet, in addition to the geometrical merit of the miniaturized base width Wb, the profile such that the impurity concentration in the graded base region 5 is gradually decreased laterally and provides an optimum built-in drift field, which can promote the carrier transport in the base region. Hence, an increase of the transport efficiency of the carriers injected into the first base region 3 and a reduction of the base transit time can be obtained, resulting in improvement of the current gain.

Consequently, in light of the above discussion and in view of the present amendment, the Examiner's rejection against Claims 1-13 under 35 U.S.C. §102(b) as being anticipated by *Bergeron* et al. is respectfully requested to be withdrawn.

The foregoing is submitted as a complete response to the Office Action identified above. This application should now be in condition for allowance, and a notice to that effect

is solicited.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES

IN THE CLAIMS

The following claims are amended:

1. (Amended) A lateral transistor comprising:

a semiconductor substrate of the first conductivity type;

a buried region of the second conductivity type disposed on said semiconductor substrate;

a uniform base region of the second conductivity type disposed on said first buried region and having a uniform doping profile;

a plug region of the second conductivity type disposed in said uniform base region, the plug region protrudes from a top surface of said uniform base region so as to reach to said buried region;

first and second main electrode regions of the first conductivity type disposed in and at the top surface of said uniform base region, the first and second main electrode regions being aligned in a lateral direction parallel to the top surface of said uniform base region; and

a graded base region of the second conductivity type disposed in said uniform base region, enclosing bottom and side of said first main electrode region such that said first main electrode region is disposed in the center at the top surface of the graded base region, the graded base region [has] having a doping profile such that impurity concentration decreases gradually along the lateral direction towards said second main electrode region from said first main electrode region,

wherein a combination of said uniform base region and said graded base region serves as a base region.

2. (Amended) The lateral transistor of claim 1, wherein said second main electrode region is formed in a ring shape along the top surface of said uniform base region, configured such that said second main electrode region laterally surrounds said graded base region.

5. (Amended) The lateral transistor of claim 2, further comprising a base wiring [contacting] being in contact with said base contact region.

6. (Amended) A semiconductor integrated circuit including a lateral transistor, the lateral transistor comprising:

a semiconductor substrate of the first conductivity type;

a first buried region of the second conductivity type disposed on said semiconductor substrate;

a uniform base region of the second conductivity type disposed on said first buried region having a uniform doping profile;

a first plug region of the second conductivity type disposed in said uniform base region, the first plug region protrudes from a top surface of said uniform base region so as to reach to said first buried region;

first and second main electrode regions of the first conductivity type disposed in and at the top surface of said uniform base region, the first and second main electrode regions being aligned in a lateral direction parallel to the top surface of said uniform base region; and

a graded base region of the second conductivity type disposed in said uniform base region, enclosing bottom and side of said first main electrode region such that said first main electrode region is disposed in the center at the top surface of the graded base region, the graded base region has a doping profile such that impurity concentration decreases gradually along the lateral direction towards said second main electrode region from said first main electrode region,

wherein a combination of said uniform base region and said graded base region serves as a first base region of said lateral transistor.

8. (Amended) The semiconductor integrated circuit of claim 7, further comprising a connecting wiring [connecting] configured to connect said second main electrode region and second base region.

10. (Amended) The lateral transistor of claim 7, wherein said second main electrode region is formed in a ring shape along the top surface of said uniform base region, configured such that said second main electrode region laterally surrounds said graded base region.

13. (Amended) The lateral transistor of claim 12, further comprising a first base wiring being in contact with said first base contact region.

VERSION WITH MARKINGS TO SHOW CHANGES IN THE CLAIMS

The following claims are amended:

1.